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Botanical Notes.

Tumble mustard. A species of mustard that promises to be one of the most formidable tumbleweeds yet introduced in the United States has been found by Mr. J. H. Sandberg and Mr. J. M. Holzinger, well established as a roadside weed in the side streets of Minneapolis. It is *Sisymbrium altissimum* L. This species was collected on ballast ground at Philadelphia in 1878, and in 1885 it was found near Castle Mountain on the western boundary of Alberta. During the past five years it has become a troublesome weed in the vicinity of Indian Head, Assiniboia. It is there known by the very appropriate name of "tumble mustard." It has also been found at Ottawa, Canada.

The tumble mustard may be distinguished from the other mustards by its slender siliques, 3 to 5 inches long, and by its characteristic tumbleweed habit, making a rather dense bush-like plant at maturity. If discovered elsewhere than in the five places mentioned, the undersigned will be grateful for reports of the localities. In case of doubt as to determination franks will be sent for mailing and the specimens will be determined at the National Herbarium.

LYSTER H. DEWEY.

WASHINGTON, D. C., August 14, 1895.

Reviews.

A Manual for the Study of Insects. John Henry Comstock and Anna Botsford Comstock. 8vo., pp. 701. Ithaca, N. Y. Comstock Publishing Company. 1895.

The entomological sky has become much cleared, so far as the student or beginner is concerned, by the publication of this *Manual for the Study of Insects.* There should be no difficulty now in determining in nearly every case the native insects as far down the scale of classification as the families to which they scientifically belong. This is made possible by numerous figures and tables of classification for each order, coupled with a general clearness of statement that does not bristle with an array of scientific terms. The book is essentially about insects and not their describers, for no authorities are given. This matter is no doubt left to the check lists and other more special works.

The first chapter deals with classification and nomenclature; the second with crabs, spiders, centipedes and other near relatives of the true insects, and the remaining nineteen with the six legged insects or Hexapoda, each chapter being devoted to a separate order. This number of orders, as Prof. Comstock says, slightly exceeds that commonly adopted. The difference, as will be seen by the reader, results from dividing the Platyptera of recent classifications into four separate orders. Those adopted in the work are the following:

THYSANURA	Bristle-tails, Spring-tails.
EPHEMERIDA	May-flies.
ODONATA	Dragon-flies.
PLECOPTERA	Stone-flies.
ISOPTERA	White-ants.
CORRODENTIA	Procids and Book-lice.
MALLOPHAGA	Bird-lice.
EUPLEXOPTERA	Earwigs.
ORTHOPTERA	Cockroaches, Crickets, Grasshoppers, etc.
PHYSOPODA	Thrips.
HEMIPTERA	Bugs, Lice, Alphids and others.
NEUROPTERA	Aphis-licris, Ant-licris and others.
MECOPTERA	Scorpion-flies, etc.
TRICHOPTERA	Caddice-flies.
LEPIDOPTERA	Moths and Butterflies.
DIPTERA	Flies.
SIPHONAPTERA	Fleas.
COLEOPTERA	Beetles.
HYMENOPTERA	Bees, Wasps, Ants and others.

It is not supposed that this sequence is altogether a natural one, but the best that can be expressed in a linear series, and indeed, it does not make any difference whether, for instance, the Lepidoptera immediately precede or follow the Diptera.

The greatest space is given to the chapter on Lepidoptera, which occupies 222 pages, and it is chiefly in this much collected order that changes of classification are noticed. They are based upon the venation of the wings; the character of the antennæ, vestiture, etc., not holding so prominent a position as in other systems. This classification seems to be very good so far as clearness is concerned, and is easily comprehended by the general reader, but perhaps specialists will not take to it so kindly.

In the chapter on Coleoptera the tiger beetles are mentioned first and the *Scolytidae* last. In some recent classifications running from the lowest to the highest this system is reversed.

The book is finely illustrated, containing 797 figures and six plates, the frontispiece (Plate I.) being colored. On page 154 is a picture of four grotesque leaf-hoppers sitting in a row on a grass blade, who rival in absurdity of expression the famous Brownies. Some of the illustrations include the plants on which the insects feed, and the food plants are also often mentioned in the text. Entomology as a rule does not form a conspicuous part in books on botany, but the botany of an entomology is a more important matter, many of the insects taking their names from the plants upon which they feed. The illustrations of the wing-veins are particularly numerous, and it is these, and the tables for determining the families and higher groups, that contribute largely to the clearness of the book. W. T. Davis.

Studies in Plant Development. Henry L. Clark. Chicago. 1895.

One is at a loss to know just what to say on examining this outline of plant analysis, for such it is, neither more nor less. Judging from its mechanical construction and arrangement one would conclude that it was intended to serve as an aid in teaching young children the first principles of systematic arrangement, but the terminology, which is that of Vines (see his recent text-book on botany), will at once condemn it for such a purpose. The terminology used would lead one to suppose that it was intended for the use of advanced students and specialists in botany. Any one sufficiently advanced to comprehend the meaning and application of such terms as *gametophyte*, *apogamy*, *germ-plasm*, *body-plasm*, *microspore*, *macrospore*, etc., etc., certainly does not require an outline in the study of plant types. It is detrimental to teach students that such outline-study is botany. It is true, the author recommends a " constant use " of Vines' Text Book of Botany in connection with this outline work, which is good as far as it goes. It is, however, wholly wrong to teach students that they can become systematists without having first studied morphology and physiology. This prevailing idea has already done an inestimable amount of harm to the advance of botany. No student " may quickly be taught the small amount of technique (of the compound microscope) necessary to do outline work." It requires years of patient toil to learn how to use the compound microscope. *Any* person can look down the tube of a compound microscope, but whether said person knows and comprehends what he sees, or whether he sees anything at all, is another question. My advice is that the student should lay aside the "Studies in Plant Development" until he has mastered the rudiments of plant morphology and physiology by years of patient work in some well equipped laboratory and by consulting not only Vines but all other standard authorities on plant physiology and morphology. After this is accomplished the "Studies" may be permanently stored away in the garret along with other similar analyses.

As far as the make-up of the "Studies" is concerned it lacks nothing. Binding, paper and print are excellent. There is space for the "study" of fifty types. A short list of modern (Vines) botanical terms with etymology and meaning is added. In his classification we are pleased to note that lichens are recognized as a distinct class. It may be that the "Studies" could be made use of by advanced students in our universities, provided it was thought advisable to take the time for making the records. Of what use these records might be afterwards is more than we can understand at present because there are already printed records of all the known plant species.

It is with regret that we make this adverse criticism, but we firmly believe that any mistaken tendency should be checked early. The mistaken idea of what constitutes plant study has already gained such a strong footing that we must put forth every effort to check its progress. Let us sincerely hope that pernicious "plant analyzing" may never be substituted for *Botany* in our higher institutions of learning. Let us hope that in the future the author will expend his time and talent on some work which will prove a real benefit to the advance of botanical science.

ALBERT SCHNEIDER.